

WHAT IS CLAIMED IS

1. A method of manufacturing a semiconductor device including a plurality of processing processes, the method comprising:

- 5 a first step of acquiring a measurement value pertaining to a wafer to be subjected to a predetermined processing process;
- a second step of determining processing requirements for the predetermined processing process on the basis of the measurement value; and
- 10 a third step of performing the predetermined processing process in accordance with the processing requirements determined in the second step.

2. The method of manufacturing a semiconductor device according to claim 1, wherein the predetermined processing is etching of a predetermined film to be processed, and the predetermined measurement value is a value expressing a physical quantity of the film to be processed.

20 3. The method of manufacturing a semiconductor device according to claim 2, wherein the measurement value is the thickness of the film to be processed.

25 4. The method of manufacturing a semiconductor device according to claim 2, wherein the film to be processed is a silicon oxide film including impurities, and the measurement value is the concentration of impurities contained in the silicon oxide film.

30 5. The method of manufacturing a semiconductor device according to claim 2, wherein the measurement value is the refractive index of the film to be processed.

6. The method of manufacturing a semiconductor device according to claim 2, wherein the measurement value is the dimension of the film to be processed.

5 7. The method of manufacturing a semiconductor device according to claim 1, wherein the first step comprises a sub-step in which a measurement apparatus disposed in a manufacturing line acquires the predetermined measurement value;

Sub
10 the second step includes a sub-step in which the measurement apparatus transmits the predetermined measurement value to a main computer disposed in the manufacturing line, and a sub-step in which the main computer determines the processing requirements on the basis of the measurement value by reference to a processing recipe stored in the main computer in advance; and

15 the third step includes a sub-step in which the main computer transmits the processing requirements determined in the second step to a processing apparatus disposed in the manufacturing line, and a sub-step in which the processing apparatus performs the predetermined processing process in accordance with the
20 processing requirements.

8. The method of manufacturing a semiconductor device according to claim 1, wherein the first step comprises a sub-step in which a measurement apparatus disposed in a manufacturing line
25 acquires the predetermined measurement value;

 the second step includes a sub-step in which the measurement apparatus transmits the predetermined measurement value to a main computer disposed in the manufacturing line, a sub-step in which the main computer transmits an instruction signal determined on
30 the basis of the measurement value to a processing apparatus disposed in the manufacturing line, and a sub-step in which the processing apparatus determines the processing requirements on

the basis of the measurement value by reference to a processing recipe stored in the main computer in advance; and

the third step includes a sub-step in which the processing apparatus performs the predetermined processing process in accordance with the processing requirements determined in the second step.

9. The method of manufacturing a semiconductor device according to claim 1, wherein:

the predetermined processing is wet etching of a predetermined film to be processed;

the predetermined measurement value is a value expressing the physical quantity of the film to be processed;

the method further comprises a fourth step of counting a time which has elapsed since replacement of a chemical to be used for the wet etching;

in the second step, wet-etching processing requirements are determined on the basis of the measurement value and the elapsed time; and,

in the third step, wet etching of the film is performed in accordance with the wet-etching processing requirements.

10. A method of manufacturing a semiconductor device, comprising the steps of:

wet etching a predetermined film to be processed;

counting a time which has elapsed since replacement of a chemical to be used for the wet etching; and

determining processing requirements for the wet etching on the basis of the elapsed time;

wherein said wet etching is performed in accordance with the processing requirements.

11. A semiconductor device manufacturing system which performs a plurality of processing processes, the system comprising:

5 a measurement apparatus for acquiring a predetermined measurement value pertaining to a wafer to be subjected to a predetermined processing process;

a recipe determination section for determining processing requirements for the predetermined processing process on the basis of the measurement value; and

10 a processing apparatus for performing the predetermined processing process in accordance with the processing requirements determined by the recipe determination section.

12. The semiconductor device manufacturing system
15 according to claim 11, wherein the predetermined processing is etching of a predetermined film to be processed, and the predetermined measurement value is a value expressing a physical quantity of the film to be processed.

20 13. The semiconductor device manufacturing system according to claim 12, wherein the measurement value is the thickness of the film to be processed.

14. The semiconductor device manufacturing system
25 according to claim 12, wherein the film to be processed is a silicon oxide film including impurities, and the measurement value is the concentration of impurities contained in the silicon oxide film.

30 15. The semiconductor device manufacturing system according to claim 12, wherein the measurement value is the refractive index of the film to be processed.

16. The semiconductor device manufacturing system according to claim 12, wherein the measurement value is the dimension of the film to be processed.

- 5 17. The semiconductor device manufacturing system according to claim 11, further comprising a main computer capable of establishing communication with the measurement apparatus and the processing apparatus; wherein the main computer comprises:
- 10 the recipe determination section;
- a measurement value receiving section for receiving the measurement value transmitted from the measurement apparatus;
- a recipe memory for storing a plurality of processing recipes; and
- a recipe transmission section for transmitting processing
- 15 requirements determined by the recipe determination section to the processing apparatus; and wherein the recipe determination section determines the processing requirements on the basis of the measurement value by reference to the processing recipe stored in the recipe memory.
- 20 18. The semiconductor device manufacturing system according to claim 11, further comprising a main computer capable of establishing communication with the measurement apparatus and the processing apparatus; wherein the main computer comprises:
- 25 a measurement value receiving section for receiving the measurement value transmitted from the measurement apparatus; and
- an instruction transmission section for transmitting to the processing apparatus an instruction signal in accordance with
- 30 the measurement value;
- wherein the processing apparatus comprising:
- the recipe determination section; and

a recipe memory for storing a plurality of processing recipes;

wherein the recipe determination section determines the processing requirements on the basis of the instruction signal
5 by reference to the processing recipe stored in the recipe memory.

19. The semiconductor device manufacturing system according to claim 11, wherein:

the processing apparatus is a wet-etching apparatus for
10 subjecting to wet etching a predetermined film to be processed;

the measurement apparatus is an apparatus for measuring a value representing a physical quantity of the film to be processed;

said manufacturing system further comprises an
15 elapsed-time management section for counting a time which has elapsed since replacement of a chemical to be used for the wet etching, and a recipe correction section for correcting requirements for the wet etching in accordance with the elapsed time; and

20 the wet-etching apparatus performs the wet etching in accordance with the processing requirements processed by the recipe determination section and the recipe correction section.